South Mountain Transportation Corridor Study

Citizens Advisory Team
Technical Report Summary

Draft Jurisdictional Waters

Why study jurisdictional waters in the Environmental Impact Statement (EIS)?

During the 1970s, a growing public concern for uncontrolled polluting of America's waterways led to enactment of what would come to be known as the Clean Water Act (CWA). The Act established the structure for regulating discharges of pollutants into the waters of the United States. Waters of the United States are also referred to as 'jurisdictional waters'.

Over the years, the definition of 'jurisdictional waters' has become more complex. For purposes of presentation in this summary *only*, jurisdictional waters are navigable waters, related tributaries, and adjacent wetlands. These waters are regulated for the purposes of navigation and commerce, among other reasons. Section 404 of the Clean Water Act is one section of the Act that regulates what can be placed in jurisdictional waters. Under Section 404, the project proponent must obtain a permit from the U.S. Army Corps of Engineers (USACE) to discharge materials into or dredge materials out of jurisdictional waters. Various levels of permitting are allowed based upon the level of activity to occur in the jurisdictional waters and the value of the waters themselves. Simply, the greater the activity to occur in waters considered to be important, the greater the degree in complexity in the permitting process and the ability to gain permit approval.

The placement of structures such as bridge embankments, bridge piers and abutments, and culverts would be activities potentially discharging materials into jurisdictional waters. For the purposes of the EIS, the study team determines if jurisdictional waters are within the Study Area and if so, how the proposed freeway alternatives might affect jurisdictional waters in accordance with the requirements set forth in Section 404.

What kind of impacts would occur from construction?

A project like the South Mountain Freeway could require the placement of structures such as bridge embankments, bridge piers and abutments into jurisdictional waters leading to the discharge of dredged or fill material into the Salt River.

A project like the South Mountain Freeway could also cross ephemeral washes (washes that have water only during and for a short period following precipitation). In some instances, these washes may be channelized to control stormwater runoff and directed toward culverts allowing such waters to cross under the freeway.

Are there jurisdictional waters that could be affected by the South Mountain Freeway?

There are two areas where jurisdictional waters could be affected (Figure 1).

- The Salt River would be considered jurisdictional waters. The jurisdictional boundaries would be considered the 'ordinary high water mark', commonly thought of as the distinct riverbank demarcation.
- On the south side of South Mountain, there are over 50 ephemeral washes that the freeway would potentially cross along the E1 Alternative.

Draft Jurisdictional Waters

How do the alternatives differ in construction-related impacts?

The alternatives and options in the Western Section would have similar potential impacts to jurisdictional waters, as shown in the table below. These impacts would be related to the Salt River crossing. The E1 Alternative would potentially affect ephemeral washes on the south and southwest side of South Mountain. Some of these ephemeral washes may need to cross under the freeway in a common conveyance culvert rather than individually. Temporary construction zones may have additional impacts.

Alternative	Salt River Potential Jurisdictional Waters Encroachment (acres)[a]	Ephemeral Washes Potential Jurisdictional Waters Encroachment (acres)[a]
Western Section Alternatives		
W55	21.6	N/A
W71	18.3	N/A
W101WPR	22.9	N/A
W101WFR	22.9	N/A
W101CPR	22.9	N/A
W101CFR	22.9	N/A
W101 EPR	22.9	N/A
W101EFR	22.9	N/A
Eastern Section Alternative		
E1	N/A	3.5
N/A: Not Applicable		

[a]Potential actual impacts would be less and limited to pier placements

What kinds of freeway operational impacts (post-construction) would occur?

Once the project is constructed and open to use, no further discharge of dredged or fill materials is anticipated. The Arizona Department of Transportation will obtain a permit in accordance with the requirements of Section 404. The permit will outline specific measures to be undertaken to ensure no further degradation (such as increased erosion or water quality degradation) of jurisdictional waters would occur as a result of the project. Details of the mitigation plan associated with the permit will be presented in the Final EIS and further refined during the final design process for the selected alternative.

The bridge structure across the Salt River would generate runoff into the river. Whether this flow is directly drained into the river, or will flow into a settlement basin before discharge into the river, will be determined during final design through coordination with the USACE and the City of Phoenix.

Draft Jurisdictional Waters

How do the alternatives differ in operational-related impacts?

There are no substantial differences in the magnitude or types of impacts.

What if the project was not constructed?

With no action, there would be no direct impacts on any jurisdictional waters; however, continued growth throughout the Study Area would likely contribute to ongoing impacts on jurisdictional waters.

Are there any specific and/or unique impacts from the build alternatives?

For a project of the magnitude of the South Mountain Freeway, there are no unique impacts anticipated. However, the U.S. Army Corps of Engineers and the City of Phoenix are looking at ways to help restore flood conveyance, habitat, and recreational values to the Salt River. The project, known as the Rio Salado Oeste, encompasses jurisdictional boundaries of the Salt River. The U.S. Army Corps of Engineers and City officials are aware of the freeway project and believe it would bring beneficial effects to their project. ADOT has agreed to work with Rio Salado Oeste planners in coordinating the two projects.

Are there things that could be done to reduce or avoid impacts?

The alternatives have been evaluated for avoidance specific to jurisdictional waters and ADOT has determined that complete avoidance is not possible. Minimization will be implemented through alternatives analysis and mitigation. Compensation measures will be implemented to account for impacts that cannot be avoided. In the Eastern Section, in some locations, bridges would be constructed instead of box culverts (as originally planned) to avoid impacts on jurisdictional waters and to allow for wildlife movement.

To help ensure water quality impacts are minimized, ADOT will prepare a water quality certification application in accordance with Section 401 of the Clean Water Act as part of the Section 404 permitting process. The application will be submitted for review and approval by the Arizona Department of Environmental Quality (ADEQ). ADEQ will review the Section 404 permit for compliance with water quality standards and will determine that the project is in compliance with ADEQ policies and Section 401 of the Clean Water Act of 1977 (33 U.S.C. 1251). ADOT will comply with specific conditions of the CWA Section 401 certification.

What can be done to reduce construction impacts?

Section 402 National Pollutant Discharge Elimination System (NPDES) of the Clean Water Act requires that ADOT, or its contractor, obtain a permit before beginning construction.

The permit requires that a Stormwater Pollution Prevention Plan (SWPPP) be prepared. The plan will include what are known as Best Management Practices for controlling construction related pollution discharge. Some of the types of practices ADOT could employ to reduce impacts in the floodplains during construction include:

- Constructing silt barriers
- Insuring construction equipment is in good working order
- Creating sediment basins
- Using controlled equipment fueling and maintenance areas
- Ensuring proper disposal of potentially contaminated materials
- Limiting vegetation removal and soil disturbance
- Seeding and mulching exposed slopes immediately after construction
- Ensuring existing flows of existing canals and irrigation water

ADOT will develop a specific SWPPP during the final design efforts for the project.

What can be done to reduce jurisdictional waters impacts once the freeway is operating?

Section 404 permitting mitigation requirements will be followed post-construction. Measures will be presented in the Draft EIS and finalized during the final design process after the EIS process is completed.

Are the conclusions presented in this summary final?

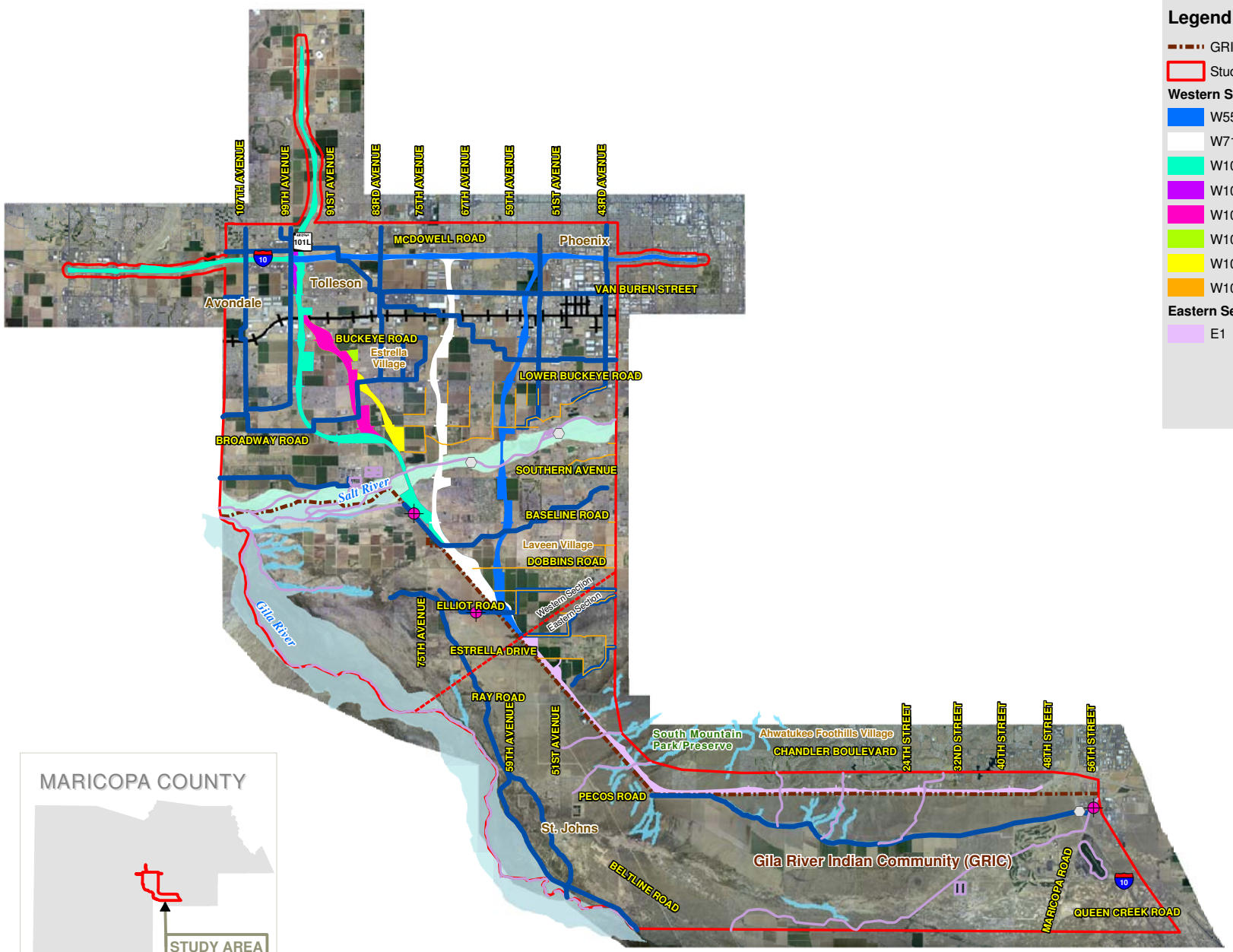
It is quite likely that quantitative findings relative to impacts are subject to change. The reasons for future changes which will be presented to the public during the Draft EIS, Final EIS and Final Design stages are based on the following:

- Refinement in design features through the design process.
- Updated aerial photography as it relates to rapid growth in the Western Section of the Study Area.
- On-going communications with the City of Phoenix regarding measures to minimize harm to South Mountain Park/Preserve.
- On-going communications with the Gila River Indian Community (GRIC) in regards to granting permission to study action alternatives on GRIC lands.
- Potential updates to traffic forecasts as updated regularly by MAG.
- Potential updates with regards to the special 2005 survey to augment the 2000 Census.
- As design progresses, cost estimates for construction, right-of-way acquisition, relocation and mitigation will be updated on a regular basis.

However, even with these factors affecting findings, it is anticipated the affects would be equal among the alternatives and consequently impacts would be comparatively the same. This assumption would be confirmed if and when such changes were to occur.

As a member of the Citizens Advisory Team, how can you review the entire technical report?

The complete technical report is available for review by making an appointment with Mike Bruder at 602-712-6836 or Mark Hollowell at 602-712-6819.



South Mountain Transportation Corridor
TRACS No. 202L MA 054 H5764 01L
Federal Aid Number FHWA-AZ-EIS-202-D
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Jurisdictional Waters Report

Jurisdictional Waters

South Mountain Freeway
Transportation Corridor Study

Aerial Photography Date: April 2006

Figure 1

South Mountain Transportation Corridor Study

Citizens Advisory Team
Technical Report Summary

Draft Water Resources

Why study water resources in the Environmental Impact Statement (EIS)?

It is clear that as our population grows in the West, water has become and will continue to be a very important resource. Water will be even more important to residents in the arid southwestern portion of the United States. As such, how we use, conserve, and treat our water will continue to be of utmost importance in the years ahead. In the southwest, we depend on both surface water and groundwater supplies for our every day uses (i.e., drinking, irrigation, flood control, and recreation).

A project like the proposed South Mountain Freeway could have effects on water resources in the Study Area. If not planned for and constructed properly, the project could alter surface and ground water conditions. Some examples are:

- Surface water flows into neighboring washes and rivers like the Salt River could be altered. This could have effects on neighboring vegetation, habitat, and water flow volumes. A project like the South Mountain Freeway could also alter the direction in which water flows in the Study Area.
- Quality of the water entering drainages as well as in the ground water could be altered.
- Existing wells in the path of the South Mountain Freeway could be closed and in turn, new wells would have to be located.

For the purposes of the EIS, the study team analyzes the potential impacts on water resources in the Study Area. Depending on the types of impacts identified, the study team would propose measures to avoid, reduce or otherwise mitigate the impacts when appropriate.

Conversely, surface water flows, if left uncontrolled can cause substantial damage to a project like the proposed South Mountain Freeway once constructed. Consequently, the study team looks at drainage features that would need to be incorporated into the project design to ensure surface water flows do not cause damage to the freeway.

What kind of impacts would occur from construction?

There are several ways the construction of a project like South Mountain Freeway could alter water resources in the Study Area. Some examples are listed below:

- Surface water quality could be altered from runoff drainage and equipment operations. If not properly planned for, silt, sediment, and equipment-related materials could enter into neighboring drainages altering the quality of the surface water.
- For a project of the magnitude of the proposed South Mountain Freeway, it would not be unusual for construction to occur in close proximity to both active and closed wells. These wells tap into the Study Area's groundwater supplies. Unforeseen construction accidents such as equipment spills could result in undesirable runoff into these wells and in turn, possibly be detrimental to the quality of groundwater supplies.
- There likely would be numerous types of wells in the Study Area. State government typically keeps very close track of the wells' locations and purposes (in the case of Arizona, the Arizona Department of Water Resources (ADWR) monitors the wells).

Draft Water Resources

Wells within the possible path of a project like the South Mountain Freeway are often used for monitoring, production, geotechnical observation, domestic uses, testing purposes and irrigation. If such a well(s) is within the proposed right-of-way, the Arizona Department of Transportation (ADOT) would need to look at ways to relocate the well to a new location. If the well is inoperable, ADOT would look at what would need to be done to cap the well to ensure no degradation to ground water supplies would occur. See Figure 1 for wells located in the Study Area.

For the South Mountain Freeway project, do the alternatives differ in construction-related impacts?

There would be no substantial differences in the types or magnitude of potential impacts on water resources as a result of project construction. There is a possibility that construction activities could alter surface water flows and the quality of the flows into neighboring washes and rivers like the Salt and Gila rivers, and in turn, have effects on neighboring vegetation, habitat, as well as flow volumes and the direction of the flows. However, there are many required and standard construction practices that would be implemented to reduce the potential for these kinds of incidents from occurring. They are summarized later in this document.

There are a number of wells potentially affected by relocation as shown in the table below. For a project like the South Mountain Freeway, the number of wells within the proposed alignments is not considered unusual. As mentioned, many of these wells tap into the Study Area's groundwater supplies. Unforeseen construction accidents such as equipment spills could result in undesirable runoff into these wells and in turn, possibly be detrimental to the quality of groundwater supplies. Again however, there are many required and standard construction practices that would be implemented to minimize these kinds of incidents from occurring. They too are summarized later in this document.

Alternative/Options	# of Wells
Western Section	
W55	17
W71	25
W101WPR	44
W101WFR	45
W101CPR	45
W101CFR	46
W101EPR	43
W101EFR	44
Eastern Section	
E1	26

Draft Water Resources

What kinds of freeway operational impacts (post-construction) would occur?

Surface water quality could be altered from runoff drainage (until seeded vegetation is established) and by increased pollutants from vehicles using the impervious surface of the freeway.

Do the alternatives differ in operational-related impacts?

When operating, any of the alternatives or options would have similar kinds and levels of impacts on surface water quality. There are no distinct differences in operational-related impacts among the action alternatives.

What if the project was not constructed?

No project specific impacts would be experienced. However, urban growth is projected to continue in the Western Section and traffic volumes would increase on surface streets as a result. Pollutants would continue to increase on surface streets and drainage runoff from construction areas would continue.

Are there any specific and/or unique impacts from the action alternatives?

There appear to be two unique potential impacts specific to the proposed South Mountain Freeway project. The first is common to all action alternatives in the Western Section of the Study Area. These alternatives would likely cross several irrigation canals within the Study Area. However, the impact on these canals can be mitigated by pipe conveyance under the freeway, which is a standard practice.

The second 'unique' potential impact relates to the 'cuts' that are anticipated through three ridgelines of the South Mountains along the northern border of the Gila River Indian Community. It is expected that the cuts may be substantial in size and could pose challenges in controlling unwanted runoff during construction and once in operation.

Are there things that could be done to reduce or avoid impacts?

ADOT will look at a number of ways to avoid, reduce, or otherwise mitigate construction-related impacts. Examples of some of the measures ADOT could undertake are listed below.

The actions that would be taken to reduce construction impacts are governed by Section 402 (NPDES) of the Clean Water Act (CWA). A permit would be required when ground disturbing activities exceed one acre. This project would disturb more than five acres and as such is considered a large construction project and a permit will be required.

The permit would include the development of a Stormwater Pollution Prevention Plan (SWPPP) which includes what are known as Best Management Practices for controlling construction

related pollution discharge. The types of practices ADOT could employ to reduce impacts include:

- Construction of silt barriers
- Inspect construction equipment
- Establish sediment basins
- Identify and use controlled equipment fueling and maintenance areas
- Proper disposal of potentially contaminated materials
- Limit vegetation removal and soil disturbance
- Maintain flatter slopes
- Clean freeway at construction completion
- Seed and mulch exposed slopes immediately after construction
- Abandon/replace existing groundwater wells as necessary. New wells installed in accordance with Arizona Department of Water Resources (ADWR) requirements.
- Allow flow of existing canals, irrigation water, etc.

ADOT will develop a specific SWPPP during the final design efforts for the project.

If a well is affected due to roadway construction, well abandonment and compensation (drilling a new well) may be required. Impacted wells that require full replacement via drilling a new well will be required to comply with the 2006 ADWR well impact rules.

Other measures that ADOT can consider are:

- Surface water quality could be improved when the freeway is open to operation by proper maintenance of the retention, detention, and stormwater runoff facilities.
- For wells that are affected during construction, the well would be abandoned and the owner would be compensated by drilling a new well.
- Affected irrigation ditches could be conveyed via pipe under the freeway.
- Clean Water Act Section 401 certification by the ADEQ will be conducted.

What can be done to reduce water resource impacts once the freeway is operating?

There are a range of activities ADOT could undertake during construction to reduce operational impacts when the freeway is open to the public. These measures could include:

- Properly designed roadway channels resistant to erosion.
- Maintain appropriate slope vegetation.
- Rock slope protection where necessary.
- Settling basins for containment of initial flow of pollutants during precipitation.

Measures will be presented in the Draft EIS and finalized during the final design process after the EIS is completed.

Draft Water Resources

Are the conclusions presented in this summary final?

It is quite likely that quantitative findings relative to impacts are subject to change. The reasons for future changes which will be presented to the public during the Draft EIS, Final EIS and Final Design stages are based on the following:

- Refinement in design features through the design process.
- Updated aerial photography as it relates to rapid growth in the Western Section of the Study Area.
- On-going communications with the City of Phoenix regarding measures to minimize harm to South Mountain Park/Preserve.
- On-going communications with the Gila River Indian Community (GRIC) in regards to granting permission to study action alternatives on GRIC lands.
- Potential updates to traffic forecasts as updated regularly by the Maricopa Association of Governments.
- Potential updates with regards to the special 2005 survey to augment the 2000 Census.
- As design progresses, cost estimates for construction, right-of-way acquisition, relocation and mitigation will be updated on a regular basis.

However, even with these factors affecting findings, it is anticipated the affects would be equal among the alternatives and consequently impacts would be comparatively the same. This assumption would be confirmed if and when such changes were to occur.

As a member of the Citizens Advisory Team, how can you review the entire technical report?

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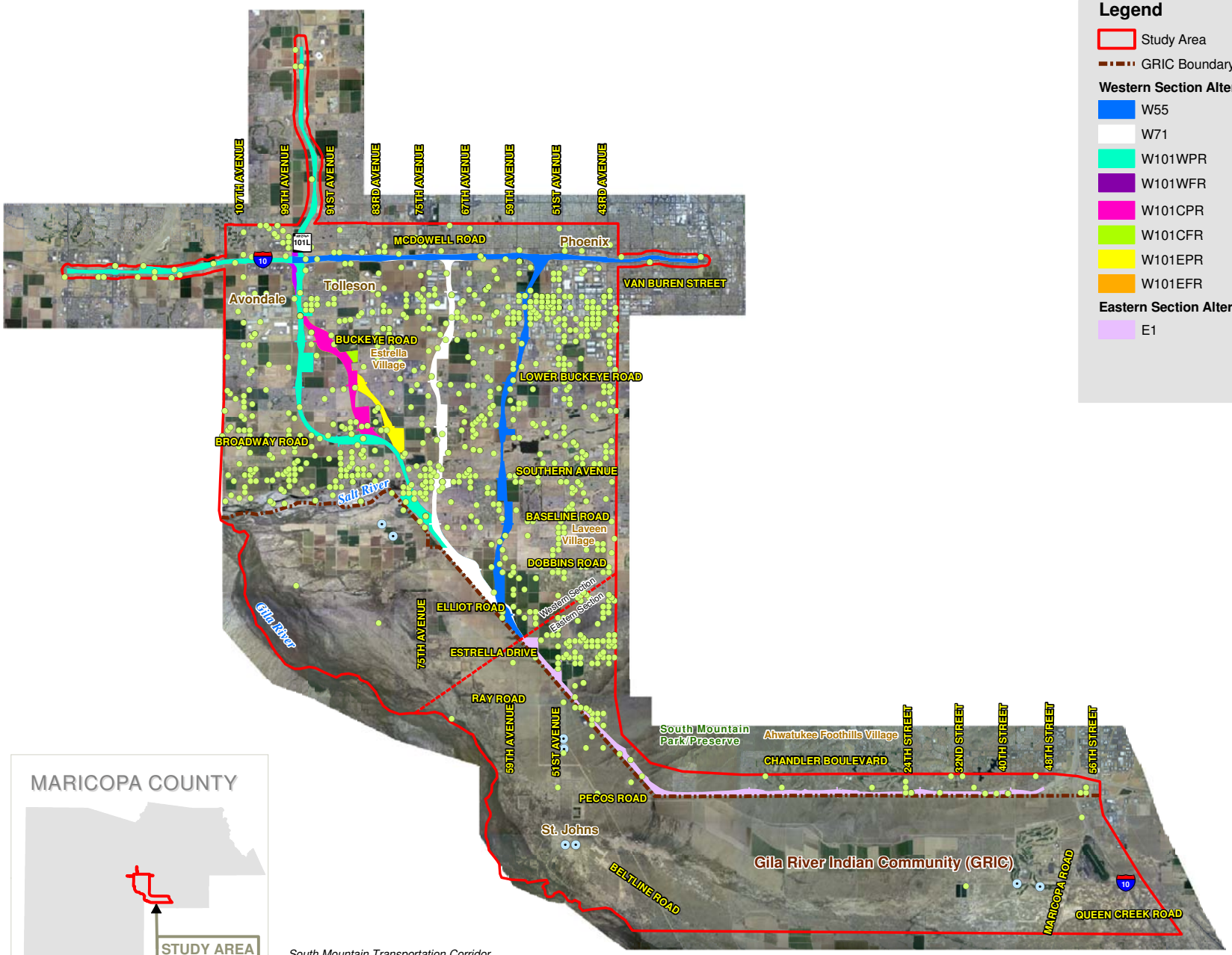

Legend

- Study Area
- GRIC Boundary
- Well
- GRIC Public Water Supply Well

Western Section Alternatives

- W55
- W71
- W101WPR
- W101WFR
- W101CPR
- W101CFR
- W101EPR
- W101EFR

Eastern Section Alternative

- E1

0 6,000 12,000 Feet

1 inch equals 12,000 feet

N

South Mountain Transportation Corridor
TRACS No. 202L MA 054 H5764 01L
Federal Aid Number FHWA-AZ-EIS-202-D

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Water Resources Report

Water Resources Wells

South Mountain Freeway Transportation Corridor Study

Aerial Photography Date: April 2006

Figure 1

South Mountain Transportation Corridor Study

Citizens Advisory Team
Technical Report Summary

Draft Floodplains

Why study floodplains in the Environmental Impact Statement (EIS)?

Floodplains are an important component of the human and natural environment. Floodplains create a specific area for water to pass through during times of high water flow to prevent flooding in other locations (i.e., streets, businesses or homes). The boundaries of floodplains are determined and mapped by the federal government.

Floodplains also can provide natural and beneficial values. Such values include habitat for wildlife, open space and recreation areas, areas for farming, recharge of groundwater, and even mining opportunities.

Structures such as buildings or bridge piers when placed in floodplains have the potential to reduce the ability of the floodplain to handle the high water flows. This could cause flooding to occur in areas not intended for carrying flood waters. There are regulations in place that regulate what can be constructed in floodplains.

A project like the South Mountain Freeway could require bridges over floodplains. To construct such a crossing, it may be necessary to place bridge piers in the floodplain. The study team has analyzed if such a crossing would cause any changes to floodplain values and boundaries in the Study Area and the findings are summarized below.

What kind of impacts would occur from a project like the South Mountain Freeway?

A project like the South Mountain Freeway could alter floodplain boundaries and/or it could alter the natural and beneficial values that are provided by a floodplain.

Are there floodplains that could be affected by the South Mountain Freeway?

There are two known floodplains that could be affected (Figure 1).

- The Salt River floodplain is located through the entire Western Section of the Study Area. It has been substantially altered from its natural conditions through mining and agricultural uses over the course of time.
- There is an un-named floodplain just north of the Union Pacific Railroad (UPRR) tracks to the south of Van Buren Street. It is a discontinuous floodplain artificially created by the Roosevelt Irrigation Canal and the railroad.

How do the alternatives differ in floodplain impacts?

The two 100-year floodplains that would be affected (Salt River and the un-named floodplain north of the UPRR tracks) may have the following potential acreage encroachment impacts if earthen embankment were used rather than a bridge:

Draft Floodplains

Western Section Alternative/Option	Salt River Floodplain Encroachment (acres)	Union Pacific Railroad Floodplain Encroachments (acres)
W55	44.4	7.7
W71	116.1	22.1
W101WPR	30.0	32.9
W101WFR	30.0	32.9
W101CPR	30.0	32.3
W101CFR	30.0	32.3
W101 EPR	30.0	32.3
W101EFR	30.0	32.3

For any of these action alternatives, the Arizona Department of Transportation (ADOT) fully anticipates constructing bridges over much of the floodplains in order to comply with federal, state and local floodplain regulations. Bridge piers and abutments will be constructed in such a way in that they do not contribute to any substantial changes in flood water elevations.

As such, all of the action alternatives represented in the table above would have similar potential impacts on the two floodplains affected by the project.

Would floodplain impacts occur once the freeway is in operation?

Floodplain impacts are not anticipated once the freeway is completed and operating regardless of the alternative that is constructed. The proposed action would not create a substantial risk because it would encroach on either of the two floodplains in only a limited way.

What if the project was not constructed?

Growth projections for the Phoenix metropolitan area show that rapid development in the Study Area will continue over the next 20 years. If the freeway were not to be constructed, it is possible the floodplain would need to be crossed in several locations at major arterial streets to enable transportation in and out of the Study Area. Some streets currently crossing the Salt River at grade can be closed due to minor flooding of the channel.

Are there any specific and/or unique impacts from the action alternatives?

For a project of the magnitude of the South Mountain Freeway, there are no unique impacts anticipated. However, the US Army Corps of Engineers (USACE) and the City of Phoenix are looking at ways to help restore flood conveyance, habitat, and recreational values to the Salt River. The project is known as the Rio Salado Oeste project. USACE and City officials are aware of the freeway project and believe it may bring beneficial effects to their project. ADOT has agreed to continuously work with Rio Salado Oeste planners in coordinating the two projects.

Draft Floodplains

Are there things that could be done to reduce or avoid impacts?

ADOT will look to minimize floodplain impacts by using transverse crossing of the floodplains and avoiding longitudinal encroachments where possible. During final design, further analysis will be done to minimize encroachment related impacts such as hydrology, hydraulics, sediment transport, and erosion analyses.

What can be done to reduce construction impacts?

Controlling both on-site and off-site drainage flow can aid in flood control. For on-site drainage control, ADOT would follow federal and state guidelines in designing drainage facilities.

To control off-site flows affecting the proposed action, project-specific measures could include:

- Culverts sized based on the design discharge of a 100-year event (an event with a 1 percent chance of occurring in any one year),
- Surcharge of water surface elevations by the new facilities limited to the existing and proposed right-of-way,
- Culverts designed to be self-cleaning,
- Reinforced Concrete Box Culvert and Reinforced Concrete Pipe provided with adequate cover, and
- Retention/detention basins strategically sized and located to control runoff flows.

Are the conclusions presented in this summary final?

It is quite likely that quantitative findings relative to impacts are subject to change. The reasons for future changes which will be presented to the public during the Draft EIS, Final EIS and Final Design stages are based on the following:

- Refinement in design features through the design process.
- Updated aerial photography as it relates to rapid growth in the Western Section of the Study Area.
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Draft Floodplains

However, even with these factors affecting findings, it is anticipated the affects would be equal among the alternatives and consequently impacts would be comparatively the same. This assumption would be confirmed if and when such changes were to occur.

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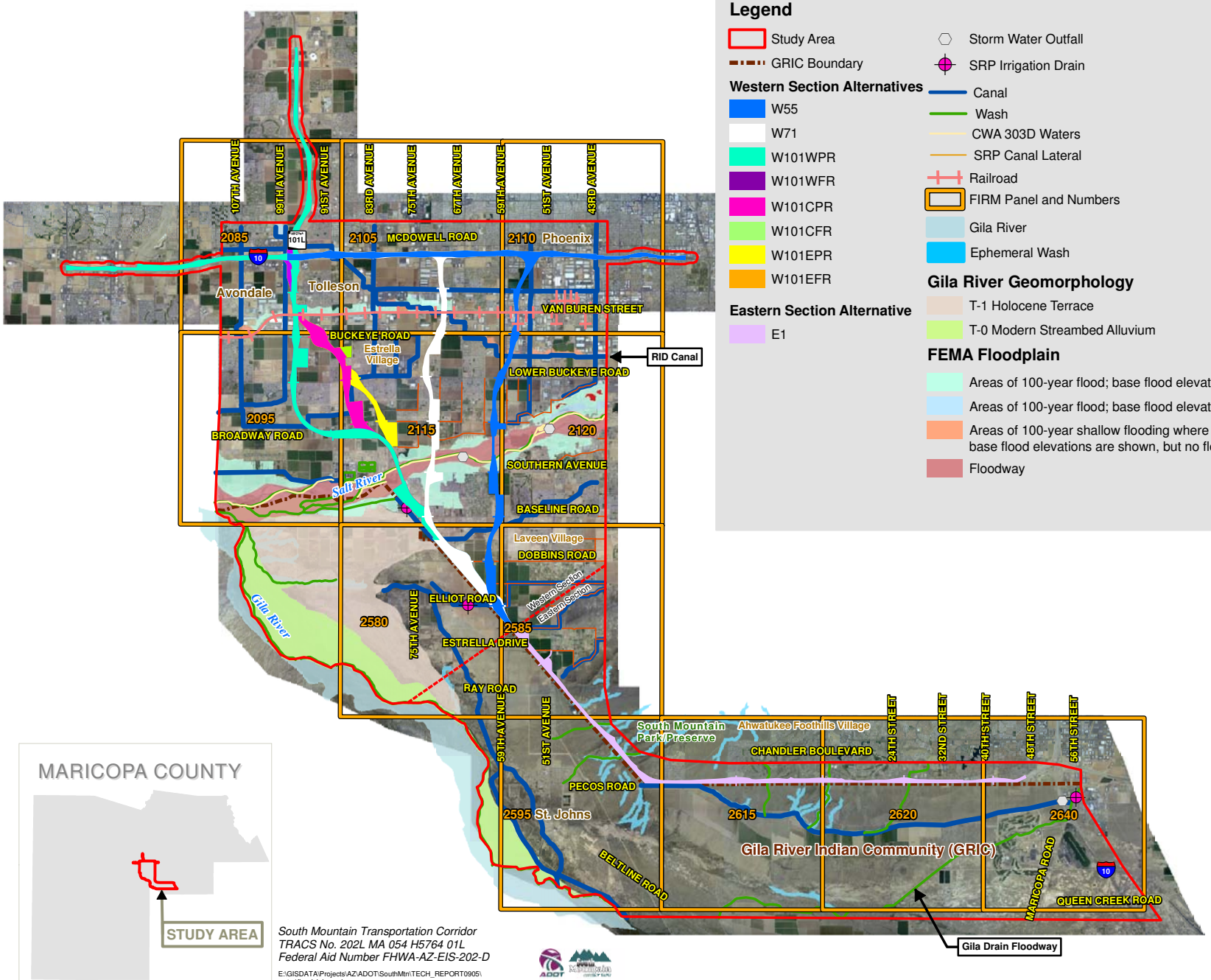

Legend

- Study Area
- GRIC Boundary

Western Section Alternatives

- W55
- W71
- W101WPR
- W101WFR
- W101CPR
- W101CFR
- W101EPR
- W101EFR

Eastern Section Alternative

- E1

- Storm Water Outfall
- SRP Irrigation Drain
- Canal
- Wash
- CWA 303D Waters
- SRP Canal Lateral
- Railroad
- FIRM Panel and Numbers
- Gila River
- Ephemeral Wash

Gila River Geomorphology

- T-1 Holocene Terrace
- T-0 Modern Streambed Alluvium

FEMA Floodplain

- Areas of 100-year flood; base flood elevations and flood hazard factors determined.
- Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
- Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
- Floodway

0 6,000 12,000 Feet

1 inch equals 12,000 feet

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South Mountain Transportation Corridor
TRACS No. 202L MA 054 H5764 01L
Federal Aid Number FHWA-AZ-EIS-202-D

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Floodplains Report

Floodplains Within the Study Area

South Mountain Freeway
Transportation Corridor Study

Aerial Photography Date: April 2006

Figure 1